EXHIBIT 246

REDACTED

Poirot: optimal bidding model for non-second price auctions

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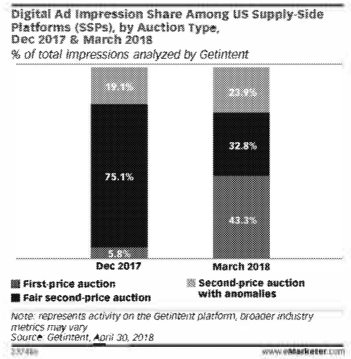
Motivation

- DBM buys on many 3PE running non-second price auctions. In such auctions, advertisers can no longer simply bid their value, and need to find optimal bidding strategies to maximize their profit.
- Buyers must adapt in a market that is rapidly shifting to openly first price auction:



3PE provided auction type	DBM impression count (Aug 2018)
unspecified	[redacted]
first price	
second price	

- Goal: find optimal bid lowering to protect advertisers from overpaying in non-second price auctions

Approach

- Maximize advertiser surplus defined as

$$surplus = \sum_{imp\ i} (value_i - cost_i)$$

where the sum is over all won impressions, with $value_i$ the impression value originally bid by the advertiser.

- Run background exploration to obtain data for bid landscape using various levels of bid multipliers
- Serve optimal bid maximizing surplus

[redacted]

Summary of model updates

- Poirot v2 was launched in Q3 2018 with 3 key updates:
  1) 3PE provided auction type signal as additional input,
  2) lower minimum bid multiplier,
  3) normalized surplus response:

[redacted]

	v1	v2
response	log relative surplus	surplus/control value
predictors	quadratic basis functions	cubic basis splines
fixed effects	exchange id	exchange id, auction type
random effects	advertiser id, bid bucket	bid bucket
minimum multiplier	0.6	0.1

Example of model fits

- Auction type signal is useful but cannot be taken as face value:

AppNexus OpenX

[redacted]

Launch impact (v2 vs v1)

- Poirot v2 is active on fixed CPM advertisers. On external exchanges:

[redacted]

- The launch results in [redacted] expected annual net profit from spend shift to AdX/AdSense
- In parallel, Poirot was also deployed for Adwords traffic, resulting in [redacted] CPD increase.

Future work

- Enhance with more query features (e.g., publisher domain)
- Optimize for active-impressions, non-spam impressions
- Optimize across exchanges
- Handle AdX move to FP

Google